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# Speech Rehabilitation of the Laryngectomized Patient

*Harold N. Williams, Ed. D.*

Much of modern man's well-being depends upon his ability to communicate with others. This ability directly affects his emotional, social and occupational life, and disruption of the communicative process may cause major problems in these areas. Man communicates in various ways; however, oral speech is by far the most important.

Speech, as we commonly know it, depends upon several factors. There must be a sound-producing mechanism; this mechanism must have a force to set it into motion, and a carrier to convey the sound from its source to its intended destination. In addition, there must be some way of breaking up this sound, thereby changing its phonetic composition. In the case of man, the breath stream is the force that sets the vibrating mechanism of the larynx into motion, producing a sound; the sound is broken up into phonetic components by the articulators (tongue, lips, teeth), and then carried to the listener by the air waves. Of course, the pharynx, nasal passages, etc. play an important part by providing this sound with resonance.

When we remove a man's larynx, we take away his sound-making mechanism and rechannel his breath stream, but the other components of speech production are left intact; that is, assuming that the surgery is confined to the larynx and does not extend into the oral cavity itself. The laryngectomized, therefore, have lost their voice through surgery, and if speech is to be restored, we must find a means of making sound once more available to their oral cavity so that they can articulate it into intelligible speech. The communicative process of speech can be regained by the utilization of an artificial larynx or through a process known as *esophageal speech*. Let me again point out that this is based upon the assumption that the patient still has functional use of his articulators.

There are two major types of artificial larynx. One produces a sound, usually through a reed mechanism, that is conveyed into the oral cavity by means of a rubber or plastic tube, held in the mouth. The other is a buzzer type of mechanism that is held against the soft tissues of the throat. Both make sound available to the oral cavity. How-

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ever, both have inherent qualities that limit their usefulness:

1. They are mechanical in nature and therefore subject to breakdown.
2. They usually require the use of one hand.
3. They call attention to the fact that the user is disabled.
4. They provide an inhuman voice quality.
5. They provide a continuous sound that lowers the user's speech intelligibility.
6. They are expensive, require upkeep, and need occasional replacement.

An artificial larynx should be recommended only as a last resort, and not even be brought into the rehabilitation process until efforts to acquire a more normal type of speech fail. The speech rehabilitation of the laryngectomized patient should be centered around training for and use of esophageal speech.

Everyone has experienced belching at one time or another. This phenomenon is brought about by air trapped in the stomach which is being forcefully pushed up through the esophagus and, as it is passing through, is constricting a portion of the esophageal walls. This constriction results in a vibration of the walls which produces a sound commonly referred to as a belch. When you blow up a balloon and restrict the escape of air by pinching together the lips of the balloon, a similar sound-producing mechanism is set into motion. Esophageal speech takes advantage of this type of phenomenon. The patient is taught to take air into the upper esophagus (not into the stomach) and to let it out gradually while constricting the walls of the esophagus. By doing this, the patient once more has a sound available to the oral cavity on which he can articulate, and thereby produce speech.

There is some controversy as to the exact manner in which esophageal speech is produced; the location of the constriction of the walls, the length of the constriction, the muscles involved, etc. However, the above general explanation is widely adhered to. It is not a simple process; frequently, it takes a long period of concentrated training to master. Some laryngectomees never develop usable esophageal speech.

The rehabilitation of the laryngectomy patient should start before surgery. I am sorry to say that this is not always the case. In this day and age of modern surgery and knowledge of the social-emotional factors involved in the total rehabilitation of a patient, we still have patients who have their larynx removed without presurgical consultation in regard to the fact that they will be voiceless after surgery, or that a means of talking can be developed. Consequently, many never completely recover from the psychological shock of being voiceless, develop habits that retard the development of esophageal speech, or even refuse to have surgery at the last moment.

Ideally, the following preoperative services should be rendered:

1. The attending physician and/or surgeon should explain the surgical procedure to be performed and the after-effects. He should also give assurance, whenever possible, to the patient that the prognosis for this type of case is good.

2. A trained speech clinician should explain the development of esophageal speech, initiate therapy while the patient can still communicate, and caution the patient against developing detrimental speech habits. An evaluation of his preoperative speech should also be obtained so that realistic goals

may be established in esophageal speech training.

3. A laryngectomized individual with good esophageal speech should visit with the patient to give encouragement and serve as an example of what can be done.

4. A rehabilitation counselor should interview the patient and discuss postoperative employment and/or vocational training plans with him.

Frequently all of the above four individuals will be unavailable to the patient. In such cases, those who are available should accept the responsibility of giving the patient the total information and/or help that has been suggested with the exception of initiation of the speech therapy which should be given only by a trained speech therapist or a successful esophageal speaker. It is my personal feeling that the most important aspect of the preoperative service is the visit by a successful esophageal speaker.

The individuals mentioned in the preoperative service may be found through contacting one or more of the following local organizations: Speech and Hearing Center or Clinic; Office of Vocational Rehabilitation; Laryngectomee Club (sometimes known as the "Lost Chord Club"); Cancer Society; Health Department; Rehabilitation Center; Department of Special Education, local School Board; Society for Crippled Children and Adults. If none of these organizations are represented in your community, you can seek assistance from the following national offices: American Hearing Society, 919 18th Street, N. W., Washington 6, D. C.; American Speech and Hearing Association, 1001 Connecticut Avenue, N. W., Washington 6, D. C.; Office of Vocational Rehabilitation, Department of Health, Education and Welfare, Washington 25, D. C.; American Cancer Society, Inc., 521 West 57th Street, New York 19, New York; National Society for Crippled Children and Adults, 2023 West Ogden Avenue, Chicago 12, Illinois; International Association of Laryngectomees—contact the American Cancer Society.

A laryngectomized patient should start his training in speech only upon the recommendation of his physician. After this has been obtained, the clinician may initiate the training for esophageal speech. The initial therapy goal would be the production of the esophageal sound.

Some patients seem to master the production of the esophageal sound with surprising ease; others find it very difficult. In general, the patient is taught to take air into the upper section of the esophagus, expelling it at will while effecting a constriction of the walls. In many cases the expulsion of air seems to cause an almost automatic constriction of the walls of the esophagus. The "trick" in esophageal speech is to get air into the esophagus.

One technique which is frequently used is the swallow method. The patient is asked to imagine that he has a small bit of food in his mouth, chew it, swallow it, and then get the air he swallows along with the imaginary food back up immediately as a simulated burp or belch. The patient is cautioned not to literally "gulp" air for it can be a very distracting habit.

Throughout the training period the clinician must be careful in seeing to it that the patient does not develop any unpleasant facial grimaces. Such grimaces would distract from what the laryngectomee has to say, as well as call undue attention to the fact that the mechanics of his speech are different.

Another method for inducing air into the upper regions of the esophagus is the push or squeeze technique. Here

the patient is asked to literally push the air into the esophagus with a backward movement of the tongue; or to reduce the area of the oral cavity by the process of forming a plosive sound, such as "b," and squeeze the air into the esophagus.

It should perhaps be pointed out here that it would be difficult to completely differentiate one method from another. What is a squeeze or push to one individual might well be a swallow to another. The reader should also keep in mind that no one method and/or technique is better than another; the patient is the important thing and what works for him is the best method.

The method that calls the least attention to itself is commonly referred to as the inhalation technique. Here the patient is asked to open his mouth slightly, making air available in the pharynx; relax the mouth and throat areas; and lower the pressure in the thorax as one would in a normal inhalation. This will draw the air from the pharynx into the esophagus. In this method the patient may need to close off the tracheostomy at the beginning of the process, but eventually should be able to do away with the closing-off. This method depends upon the patient's ability to relax and control the musculature of the thorax.

Occasionally it may be necessary to use carbonated beverages or actually inject air into the esophagus by a mechanical means, so that the patient will get the feel of air in the esophagus and the accompanying vibration of the esophageal sound.

Two of the hardest things for the trainee to learn are that his speech is no longer connected to his breathing and that he must relax. Often the laryngectomee will breathe so hard that the sound of exhalation will mask out his esophageal speech, or he will fill his lungs with so much air that pressure in the thorax makes it impossible for air to get into the esophagus. Relaxation is extremely important. Normal speech is hard when an individual is tense; esophageal speech is almost impossible.

Once the esophageal sound has been obtained, the patient should strive for prolongation of the sound and adequate volume. In the beginning the patient is prone to let all of the air and/or sound out at once, not saving enough to complete a whole word or produce more than one syllable, or use up all of his volume on the first syllable.

Vowels will usually be worked on first, and then consonants will be added to make nonsense syllables; i.e., pa, po, poo, etc. One syllable words would then be attempted and finally two and three syllable words. The laryngectomee must learn to properly break up words into syllables for he can expect to get only from five to eight syllables on one expulsion. Once words are produced, the therapy usually consists of perfecting the production, learning how to break up words into syllables, and to obtain adequate volume and inflection.

The laryngectomized patient is generally seen every day for the first two weeks and then two or three times a week for approximately six weeks. After this, he may be seen just once a month for three or four months to help him with any problems that might develop. Throughout therapy sessions and during home practice periods, the factor of patient fatigue must be considered. This is especially important in the beginning of therapy. The patient may easily overtax himself during the first week or two of training. Frequently, therapy during the first week may last for just 15 or 20 minutes, and the patient should be cautioned not to practice at home for more than 15

or 20 minutes at a time. Occasionally the patient will develop a bad cold or other condition that results in the formation of an excessive amount of mucus. This may interfere with his speech production or cause him so much embarrassment that temporary disruption of therapy would be wise.

Motivation is all important. Many people feel that once they have cancer, it is just a matter of time before they die. Consequently, they may give up all hope and will not try to help themselves. The laryngectomy patient has to be motivated to become as independent as possible. His own family must play a major role in his motivation, acceptance of his condition, and adjustment. Therapy has failed in many instances not because the patient was incapable of learning, but because the training institution was only concerned about him while he was having his 15- or 30-minute lessons. Attention must be given to the laryngectomee's social life during his training period. He must be helped to get out of his room and literally "out of himself," have fun and experience pleasure in life again. Community Centers, Y's, and other organizations that have social, recreational, or educational programs may be more than happy to take part in planning a total therapeutic program for the laryngectomee.

Given opportunity and the help now available through the medical and paramedical professions, the laryngectomee can look forward to life and communication with his fellow man.

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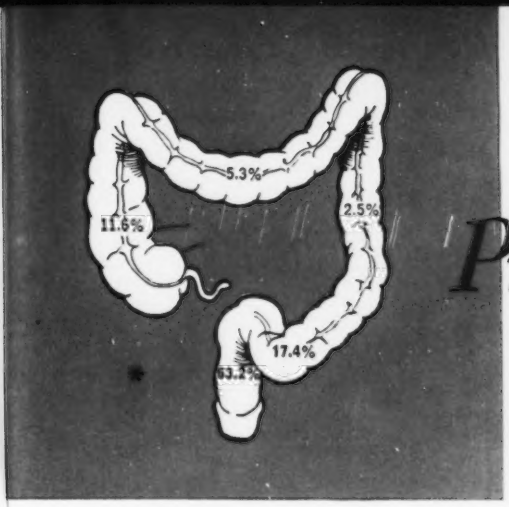
## IAL Tenth Annual Meeting

Under the banner of a "decade of progress" some 200 laryngectomees from the United States and beyond assembled at San Francisco last July 31 to August 4 to hold the tenth annual meeting of the International Association of Laryngectomees.

The IAL'ers met with medical and scientific specialists, speech therapists, and rehabilitation experts to cross-fertilize ideas, teach, learn, and focus world-wide attention on the problems of all laryngectomees. In the U. S. there are 17-20,000 laryngectomees.

In addition to the regular agenda of speech instruction, business, educational, and social programs, the annual meeting offered sessions in rehabilitation methods and a professional lecture course for potential teachers of postlaryngectomy voice. Also, a professional panel with physicians and speech pathologists was held.

Dr. John W. Cline, ACS president, delivered the keynote address.




# *Proctoscopy*
## and the public

Rectal and colon cancer, almost surreptitiously, has moved into the cancer "Public Enemy Number One" spot. Its new eminence can be explained by an actual increase in incidence as well as by the lumping together of rectal and colon cancer as one site for statistical analysis. Such a combination is justified by the common anatomy and physiology.

In 1961, an estimated 70,000 new cases of cancer of the colon and rectum will be diagnosed and it is anticipated that 39,000 Americans will die of the disease this year. Although potentially it is highly curable, more than two thirds of such patients die of the disease.

Fortunately, a means is at hand for reducing this toll. To put it into effect an educational program is needed, for both the profession and the public. Such an educational program for the medical profession was started by the American Cancer Society in 1958. The public educational program is now being launched. The goal is a simple one, while at the same time, a most difficult one. It seeks simply to persuade the public to accept proctoscopy as a part of the annual check-up. Winning the public over to this point of view is the purpose of the Society's new educational motion picture entitled LIFE STORY.

The difficulty in presenting information to the public in an interesting manner about this delicate anatomical subject can readily be appreciated. It is necessary to avoid being too technical while at the same time maintaining interest. Since persuasion and not the mere dissemination of information is the purpose of the film, fear and misunderstanding must be avoided.

The film opens by presenting a warm, friendly, former patient, Mr. Harry Leonard, telling how a routine proctoscopy performed upon him during a routine annual checkup saved his life, because a polyp which contained an early cancer was discovered and removed by a simple operation. Dr. Owen Wangensteen, Professor of Surgery, University of Minnesota, follows, and discusses in nontechnical

*Location of 880 Adenocarcinomas of the Colon and Rectum. Adapted from Earl F. Wolfman, Jr., M.D. and C. Thomas Flatte, M.D., University of Michigan, Ann Arbor, Michigan.

Make-up ordeal for a worthy cause.

language, the biology and anatomy of rectal and colon cancer, and the importance of the proctosigmoidoscopic examination in detecting this cancer while asymptomatic and in a curable stage.

The illustrations on these pages are a "behind-the-scenes" view of the making of the motion picture.

In the development of this motion picture, the Society was fortunate in having the assistance of a special committee of representatives of the American College of Surgeons, the American College of Physicians, the College of American Pathologists, the American College of Radiology, the American Proctologic Society, the American Academy of General Practice, and the Interim Committee of Coordinators of Cancer Teaching.

"Proctoscopy saved my life and I like living."

Dr. Owen Wangensteen dresses for part and discusses script.

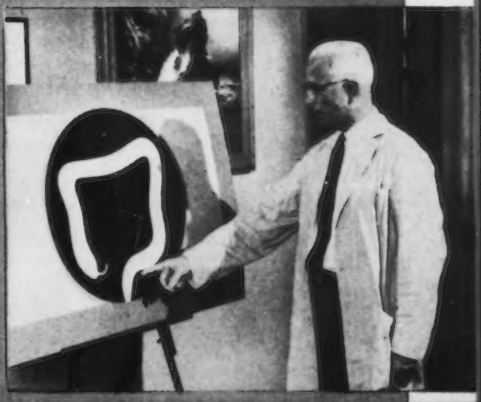
Copies of the film have been distributed to the Society's Divisions and will be reviewed by the appropriate state and county medical societies before presentation to the public.

Thousands of lives are at stake and much suffering can be avoided by bringing rectal and colon cancer under control. Since 75 per cent of cancers of the entire rectum and colon are within reach of the proctosigmoidoscope, it is an instrument which enables the medical profession to accomplish the ideal of cancer control—early detection and treatment. The cooperation of the public and the profession is needed in controlling rectal and colon cancer as perhaps in no other cancer problem. LIFE STORY is an attempt to bring the team together.

How big, how far the "scope"?

Harry Leonard, the patient, awaits his turn before the camera.

Script rehearsal with director.



Where the danger lurks.

# Cancer of the Uterus*

**Joe V. Meigs, M.D.**

Cancer of the uterus is usually divided into cancer of the cervix and cancer of the body of the uterus. A third group which should be considered is that tumor which involves both the body and the cervix. There are, of course, variations within the groups: some body cancers are technically confined to the fundus and some cervical cancers involve the endocervix only.

### Cervix and Endocervix

Cancers of the cervix and the endocervix are further divided into stages depending upon the extent of the lesion. There are those that involve the cervix only and those which involve the cervix, the vagina and later the broad ligaments; and others that penetrate the rectum or bladder or metastasize distantly. Cancer of the cervix and endocervix give the usual symptom of bleeding—not increased menstrual bleeding but spotting and bleeding following douching or intercourse.

THE DIAGNOSIS may be made by touch (a sandy feeling through the rubber glove), by inspection and by biopsy or vaginal smear.

The cell smear method makes it possible for the surgeon to find cancers that are just commencing, and it is common now to receive a report of preinvasive cancer or cancer in situ from either the cytology or the pathology laboratory. The iodine test of Schiller (because the abnormal or cancerous epithelium contains no glycogen) will point out the area of abnormal epithelium which should be the site of biopsy.

With the various methods of diagnosis and the early symptoms, such as any change in discharge or bleeding, it should be possible to find nearly every cervical cancer in an early stage. If this disease, which is favorable to treatment by radiation or surgery, is found early, a cure can be expected in 90 to 100 per cent of patients. It is very important that patients understand the reasons for going to their doctor at least once a year, and if the doctor is alert and uses the diagnostic tests available, the cure rate in this particular tumor should rise to great heights. There will probably always be some cancers that cannot be cured, perhaps because of the lack of resistance of the patient to her disease, but the results should be much better than they are.

THE TREATMENT of cervical cancer is either radiologic or surgical; there are determined advocates of both methods. It is probable that some would be better treated one way and others in another way, and it is the work of all of us to determine which is which. The radiation method is unsuccessful in curing patients who are radiation-resistant and any of the cervix remaining after treatment may be the source of another cancer later. More late recurrences follow radiation therapy than surgery, but surgical treatment causes more injuries than radiation to the ureter or bladder. No one treatment is perfect but without doubt we are improving, and the earlier the diagnosis is made the greater the possibility of cure, especially if it can be determined beforehand whether radiation or surgery should be used.

Fairly good results are obtained now in treating the more advanced cases by radiation or by ultraradical surgery, and failure of cure following radiation can sometimes be recouped by surgery,

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**Reprinted by permission of World-Wide Abstracts 3:34-35, Nov.-Dec., 1960.*

just as surgical failures can sometimes be rescued by radiation treatment.

An early diagnosis, which is now so easy to make and should definitely be attempted in all women, will make cancer of the cervix a very curable tumor. It is essential that every doctor, whether surgeon, medical man or specialist, should be able at least to feel, inspect, smear and biopsy the cervix of any woman who comes into his office. Certainly most of us while doing a physical examination do palpate the breasts of our patients, feel the thyroid gland, listen to the heart and feel the abdomen; therefore, why not careful inspection and examination of the female pelvic organs? Such an investigation should be a part of every physical examination; and what, after all, is more simple than the taking of the vaginal smear?

### The Corpus

Cancer of the body of the uterus usually occurs in the later years of life, from 50 to 70, and its symptoms are most often those of postmenopausal bleeding or discharge. Occurrence of this lesion in younger women is not common, but the presence of bleeding when no lesion of the cervix can be seen or felt is an implication that the bleeding is due to some functional or to some neoplastic lesion. Abnormal bleeding demands investigation — and the medical profession has at its command the means to accomplish this.

Palpation and pelvic examination are not likely to make the diagnosis. The smear is not so satisfactory as it is in the diagnosis of cancer of the cervix but it is good in about 80 percent of cases, and a positive smear is of great importance. If a smear is positive, it is up to the surgeon to prove that cancer is not present—to *prove* that the smear was a false positive.

A negative smear cannot be relied upon, for a smear can miss the endometrial cancer cells or they may be difficult to interpret in a good many cases, at least 20 percent. The patient with abnormal bleeding but a negative smear should in most cases be curetted because even before the menopause the lesion may be present. Curettage is simple and certainly can do little harm and yet may yield important evidence.

Then there is the group of patients with functional bleeding, and in these it is our duty as doctors to prove that it *is* functional and *not* due to malignancy. This can be done by the history, the smear, the endometrial biopsy or, best of all, efficient curettage. It is not correct, however, to state that a D & C will make the diagnosis in 100 percent of patients, for small tumors in the top of the fundus or behind a fibroid may be missed.

THE TREATMENT of cancer of the fundus is properly surgical, though radiation only has its advocates. The usual procedure is to use intracavitary radium and six weeks later to carry out a total hysterectomy with bilateral removal of the tubes and ovaries. The cervix must be removed, for it is easily involved; and since the ovaries are involved in 4 percent of cases, they also should be removed. The question of whether to radiate with radium or x-rays, to follow surgery by radium in the apex of the vagina or to use postoperative x-ray treatment is far from settled; there are those who advocate surgery without radiation at all.

The time to operate after intracavitary radium may be in two to three days or two to six weeks; there is no definite absolute rule as yet.

One of the complications in this lesion is the occurrence of metastases in the vagina, probably due to lymphatic involvement and less likely to implantation. It therefore is necessary in doing a proper operation to remove a large

cuff of vagina. The treatment of vaginal recurrence is not very satisfactory and may be either radiologic or sugical. Each has proved to be satisfactory in some cases.

The question of whether the best treatment is a simple total hysterectomy or the radical Wertheim type of hysterectomy plus the dissection of all possible pelvic nodes is far from being settled. In the good-risk patient radical surgery is possibly best but I know of only two patients in whom positive nodes were present who survived five years after the radical operation. Radical surgery in the group of older, fat, and often hypertensive patients is often too serious for even the best operator to do.

Each surgeon must make up his own mind as to the risk to the patient of radical surgery. We are surgeons because of our capabilities and each and every surgeon should know his own capacities, take pride in those he has and, if he feels inadequate to do certain operations, take pride also in admitting it and sending a difficult problem to one who has mastered that particular technique.

The results of operation in *adenocarcinoma* of the endometrium are quite good, but adenocarcinoma is actually a more serious tumor than the squamous cancer which is usual in cancer of the cervix, and therefore results are not likely to be so good if the tumor is already invasive. There are many histologic variations of adenocarcinoma, from early and slowly growing adenoma malignum to the more dangerous solid cancer or even adenosquamous cancer or adenoacanthoma. Five-year figures vary with the histology of the tumor. Some of these tumors cannot be cured because of their histologic type and the lack of resistance of the patient. It is usual that 60 to 80 per cent cures for five years are found in most series and this is actually satisfactory.

Early recognition of the importance of abnormal bleeding is the great thing; early diagnosis and early treatment are essential. It is our belief in America that surgical operation after or before radiation therapy is the best method of attack.

### Corporis et Cervicis

Carcinoma involving the body and cervix, or as the Europeans call it, "corporis et cervicis," is extremely important. The treatment is a combination of the methods used in cervical and body cancer but the five-year cures are far fewer. The results in most series are in the range of 35 percent five-year cures. The important point in this lesion is its recognition. This is done by means of fractional curettage, i.e., the cervix is curetted first and the specimens kept separately, and last, the top or fundus of the uterus is curetted. It may be possible in this way to differentiate the area of origin geographically and histologically.

The usual treatment is radiologic if all areas are found positive, followed by a radical Wertheim type of hysterectomy with removal of the pelvic lymph nodes if the patient's condition will allow it. To rely on radiation therapy only means treatment of both cervix and body, and this is not too satisfactory, as is shown by the results.

### Conclusions

1. Cancer of the cervix could be cured in nearly 100 percent of cases if all women would report once a year for observation, smear and biopsy.

2. Cancer of the body is more difficult to diagnose but curability is high if myometrial invasion has not occurred.

3. Cancer of the cervix and body is most serious and it is important that an accurate diagnosis be made.

# Carcinoma of the Pancreas, Biliary Tract and Liver

## PART I

HOWARD F. RASKIN, M.D.

*Howard F. Raskin, M.D., Robert D. Moseley, Jr., M.D., Joseph B. Kirsner, M.D., and Walter L. Palmer, M.D.*

Cancer of the pancreas, the biliary ducts, the gall bladder and the liver is one of the gravest and most challenging medical and surgical problems encountered today. A universal feeling of hopelessness is expressed in the literature which records 100 per cent mortality in most series within 12 months of surgery. Steiner has calculated the frequency of cancer of these organs from the records of all types of fatal malignancies and has estimated the present-day curability (Table 1).

Table 1

| | Per Cent of Cancer Deaths | Per Cent of Curability |
|---|---|---|
| Pancreas | 4.8 | 1 |
| Gall Bladder | 2.4 | 1 |
| Liver | 1.4 | 1 |

These gloomy figures should stimulate a greater awareness of the early symptoms of cancer of hepatic, biliary, or pancreatic origin and result in early requests for various special tests, such as those to be described—exfoliative cytology, newer roentgen techniques and, finally, radical surgery.

The differential diagnosis of diseases of the pancreas, biliary system and liver can be quite difficult at times because of the close proximity of these vital structures to one another and the general similarity in physiologic functions. The clinical patterns of these tumors are quite alike in many respects; diagnostic tests often are unable to locate precisely the site of pathology, and the same surgical considerations apply to all.

*From the Departments of Medicine and Radiology, The University of Chicago, Chicago, Illinois.*

### Pathology of Pancreatic Cancers

#### Etiology

There are no known causative factors for pancreatic tumors. The inflammation and atrophy accompanying the pancreatic tumor are usually secondary to ductal obstruction. Attempts have been made to relate parenchymal carcinoma to functional hyperplasia of the secretory pancreatic glands and ductal carcinoma to chronic inflammation and stasis of flow secondary to cirrhosis of the pancreas. This hypothesis is not widely accepted but malignant changes, both incipient and profound, have been described in multiple cystadenomas developing from dilated ducts secondary to chronic pancreatitis.

#### Gross Anatomy

The pancreas usually is enlarged; the primary growth often is firm and nodular but may infiltrate and not protrude above the surface. The consist-

ency and color vary with the cellularity of the tumor. Most neoplasms are scirrhous, white and firm when the stroma is abundant but they are soft and fleshy when connective tissue is scant. The head of the pancreas is the primary site in approximately 75 per cent of cases. The exact site of origin is often indeterminate because of spread or diffuseness. Of 39 autopsied cases reported in one study,[36] 21 tumors were in the head, nine in the body and two in the tail of the pancreas; in seven, the point of origin could not be determined. The size of the tumor averages 6 centimeters in diameter, with a range of 3 to 17 centimeters; tumors of the tail are usually the largest.

### Local Extension

The anatomical arrangement of structures adjacent to the pancreas limits spread of the neoplasm by continuity. The duodenum surrounding the head of the pancreas often is deformed and its wall invaded but infrequently penetrated. The capsules of the spleen and kidney are resistant to invasion but the left adrenal gland presents no barrier. The anterior and inferior surface of the body and tail of the pancreas are covered only by the peritoneum which provides little resistance to direct spread of the tumor to the peritoneum, diaphragm, stomach and transverse colon. The posterior wall of the stomach may be extensively involved and ulcerated so that the tumor at first glance appears to be gastric in origin. Perineural infiltration, particularly of the ramifications of the coeliac plexus, is a common occurrence.

### Distant Metastases

Practically any organ may be involved with metastases, the liver and lung being most frequently affected. Distant spread is by both blood and lymph channels. Because of anatomical differences in the venous drainage of the head as compared to the body and tail of the pancreas, tumors from the latter areas metastasize more widely. The veins of the head are of small calibre and easily obstructed by tumor, whereas the veins of the body and tail are short and broad and empty into the large splenic vein; hence, a tumor of the distal pancreas can seed an area with more cells. Metastases in the liver from the head of the pancreas are small or miliary in size, while those from the body and tail are bulky and nodular. An analogous situation occurs with lymphatic drainage. The head of the pancreas drains almost exclusively into the subpyloric nodes, while the body and tail drain into pancreatic-lineal, gastric, hepatic, coeliac, and mesenteric lymphatic chains. The characteristic spread of tumor of the body and tail thus may be explained anatomically. As might be expected, extra-abdominal metastases to the lung and elsewhere occur more commonly from the body and tail.[22]

### Microscopic Appearance

There are three distinct histologic types of pancreatic cancer. The most frequent is the cylindrical cell adenocarcinoma arising from ductal epithelium. This tumor consists of ductlike spaces lined by a columnar or cuboidal epithelium, one or more cell layers thick. The individual cell is sharply defined with a vesicular nucleus containing a single prominent nucleolus. The stroma is quite dense. Squamous metaplasia is not uncommon in tumors of ductal origin. The second type, carcinoma simplex, arises from the functioning cells of the parenchyma. These tumors are medullary in character and grow rapidly. The typical picture consists of lobular masses of relatively indistinct cells with large hyperchro-

matic nuclei and inconspicuous nucleoli. These cells often are grouped into pseudoacini, surprisingly similar to normal glandular tissue. On occasion, the ductal or glandular type may be so anaplastic that histologic origin may be determined only by the appearance of more differentiated metastases in lymph nodes. The third cell type is the islet-cell adenocarcinoma which may have a cellular structure spectacularly similar to normal islets. The tumor consists of long strands of polyhedral cells with intervening bands of connective tissue. The functioning tumors producing hyperinsulinism are composed mainly of beta cells.

Spindle cell sarcoma and lymphosarcoma of the pancreas are so rare they do not require description.

### Pathology of Gall Bladder and Bile Duct Cancers

Bile duct and gall bladder carcinomas generally are of similar histologic type and are no different than the ductal adenocarcinomas of the pancreas. The infiltrating form invades the entire wall of the gall bladder, producing a shrunken organ or stenosis of the common duct. This type is more frequent and, unfortunately, more malignant than the fungating papillary excrescence which protrudes into the lumen. An uncommon malignancy of the gall bladder is the goblet or mucus cell tumor, capable of producing sufficient mucus to distend the gall bladder and cause spontaneous perforation.

#### Gall Stones

The role of gall stones in the genesis of carcinoma of the gall bladder remains an unsettled and interesting problem. Cholelithiasis is found in at least 75 per cent of gall bladder cancers, whereas the incidence of cholelithiasis in routine autopsies is 9 per cent. The coincidence of calculous gall bladders and carcinoma varied from 1.1 to 15 per cent in a review of 17 papers on this subject.[39] Actual incidence probably approximates 3 per cent.

### Pathology of Cancer of the Liver

#### Gross Appearance

Primary tumors of the liver are of two forms, depending upon the structure of origin. Cholangiomas arise from the ductal epithelium, while the hepatomas stem from the glandular parenchyma. The cholangioma often is solitary, scirrhous, and of considerable size, quite like a metastatic lesion. The hepatoma may appear as a massive, reddish tumor with many small nodular satellites encircling it, or as numerous, discrete tumors varying in size but not as large as the massive form.

#### Microscopic Appearance

The histologic appearance of the cholangioma is similar to that of the adenocarcinoma arising from biliary ducts elsewhere. The hepatoma may be extremely well differentiated. It may simulate a regenerating cirrhotic nodule so closely that finite changes, such as a decrease in glycogen granules and nuclear changes, become important features of identification. Many of these tumors are capable of secreting bile.

#### Metastases

Extrahepatic spread occurs in 66 per cent of cases. The lungs and bones are common sites of involvement together with the peripancreatic, mediastinal and bronchial lymph nodes.

#### Metastatic Tumors of the Liver

It is estimated that 35 to 50 per cent of all malignancies, irrespective of site, will metastasize to the liver. Therefore, secondary cancer is, by far, the most common tumor in the liver. The ratio of primary to secondary tumor is about 1 to 65. The most common sites of metastatic origin are the gastrointes-

tinal tract, pancreas and bile ducts, lung, breast and genitourinary system. Hepatic metastases are much less likely to occur when the liver is cirrhotic; a reduced portal blood flow is perhaps the factor.

## Cancer of the Pancreas

### Frequency

The literature contains numerous large studies of cancer of the pancreas but clinical misdiagnoses are so frequent that one must resort to surgical and autopsy reviews. These reports require the most careful attention, since many tumors listed as "head of the pancreas" are in reality of common duct origin extending into the head. Carefully scrutinized autopsies have demonstrated that extrahepatic duct carcinoma may be three times as common as pancreatic malignancy.[54] One series[34] of consecutive necropsies listed 55 cancers of the gall bladder, 62 of the extrahepatic ducts, and only 41 of the pancreas. It is estimated that 2 per cent of all deaths in this country are due to cancer of the pancreas. One tenth of 1 per cent of all hospitalizations are for this disease. The New York State Department of Health[19] has reported a 67 per cent increase in incidence in the last 10 years.

### Age

As with many other malignancies, the greatest number of cases occur during the sixth and seventh "cancer decades." In a series of 971 cases collected from the literature by Berk[3] the average age was 56.4 years. Carcinoma of the body and tail, while considerably less frequent, occurs at an earlier age, the average being only 51 years.

### Sex and Race

Males predominate in a ratio of 2.5 to 1. Negroes seem less prone to develop cancer of the pancreas, the disease being twice as common in Caucasians.

## Clinical Course of Pancreatic Cancer

The three most common complaints are pain, loss of weight and weakness.

### Pain

Regardless of the site of primary tumor, pain occurs early and is one of the most important signs. The peculiar characteristic back pain and its abdominal component were first described in 1858[12] but have not yet received sufficient attention. Eighty-five per cent of all patients admitted to the hospital with pancreatic neoplasm report definite discomfort for as long as six months duration. The upper abdominal pain usually is localized to the epigastrium and right upper quadrant. Fifty per cent of the patients divide their pain equally in these regions; a few place their discomfort in the upper left and lower left quadrants. A large group, perhaps 40 per cent, describe vague, poorly localized upper abdominal pain. Kiefer lists three main types of pain. The first is a steady, dull, deep and penetrating midepigastric pain which, in its severe form, radiates into the back. The second type is paroxysmal, originates near the umbilicus, and radiates widely to the back, front of chest and over the abdomen. The third type of pain is colicky, begins in the upper right hypochondrium and penetrates into the right subscapular area. Lumbar back pain, occurring in approximately 35 per cent of the patients, is most pronounced on recumbency and is relieved by sitting upright, bending forward or lying curled up on the right side, as though the pancreas, heavy with tumor, stretches the coeliac nerve plexus when the patient lies flat, but a change of position relieves the pressure. In one study,[15] 12 of 88 patients described typical peptic ulcer pain relieved by food and alkali. Pain itself is not diagnostic of pancreatic cancer but

its presence should alert the physician to the need for further study.

### Weight Loss

The rapidity and extent of weight loss in pancreatic carcinoma is more marked than in malignancies of other gastrointestinal organs. Eighty-five per cent of patients have noted loss of weight when first seen; the average loss in the six months prior to hospitalization is 26 pounds. When debilitating diseases, such as hyperthyroidism, diabetes, tuberculosis, sprue, anorexia nervosa and demonstrable cancer are excluded, then cancer of the pancreas should be considered strongly.

### Fatigue and Weakness

The weakness is not characteristic; it usually is generalized and may develop rapidly. The fatigue may result partially from severe insomnia.

### Jaundice

Jaundice usually follows the onset of pain. Approximately 50 per cent of patients will have an elevated serum bilirubin on admission; an additional 25 per cent subsequently will become jaundiced. One fifth of tumors of the head of the pancreas never obstruct the common bile duct. A small number of cancers of the body and tail produce jaundice secondary to metastatic lymphadenopathy. The often-quoted dictum of "painless jaundice" holds true in only one area—namely, ampulla of Vater. All ampullary lesions develop jaundice, but the degree of icterus can fluctuate as small pieces of necrotic tumor may slough, temporarily reestablishing partial patency of the common duct.

### Gastrointestinal Symptoms

A sudden loss of appetite may be the first complaint. Nausea and vomiting are fairly common; persistent vomiting is usually indicative of pyloric or duodenal obstruction. Forty per cent of patients have constipation, many never having experienced obstipation before. Diarrhea is only one-third as common as constipation and is usually intermittent. Hematemesis is unusual and occurs more often with body and tail cancers which produce massive hepatic metastases, secondary portal hypertension and esophageal varices. Tumor erosion of the posterior gastric wall is the next most common cause of hematemesis.

### Nervous Manifestations

Five to 10 per cent of patients exhibit strong neurotic tendencies early in the course of the disease. Anxiety, depression, crying spells, hysteria, poor memory and judgment and insomnia are manifested.[72]

The following case illustrates a carcinoma of the pancreas in which a severe mental disturbance was the present complaint.

Case 1.—(H.W., #-241458) A 72-year-old retired banker complained of fatigue, loss of appetite and alternating diarrhea and constipation. His family noted sudden mental deterioration and confusion, bordering on psychosis. Physical examination, laboratory studies and roentgen studies were normal. The patient died from bronchopneumonia during the seventh week of hospitalization. Autopsy revealed a carcinoma of the body and tail of the pancreas (Fig. 1); the brain was normal.

## Primary Carcinoma of the Duodenum

Primary carcinoma of the duodenum is rare but should be mentioned since it is confused with carcinoma of the ampulla of Vater or with cancer of the head of the pancreas. In one series of 31 cases of primary duodenal tumors,[7] 27 were adenocarcinomas, two were leiomyosarcomas, and one each, lymphosarcoma and reticulum cell sarcoma. Some of the adenocarcinomas may arise from aberrant pancreatic cell rests. The gross tumor may be polypoid, ulcerating, constricting or infil-

trating. Metastases are present in two thirds of cases, particular sites being the regional lymph nodes and liver.

Case 2 describes a slowly progressive primary cancer of the duodenum which had not metastasized to the regional nodes.

CASE 2.—(J.P., #-647022) A 59-year-old housewife first noticed postprandial substernal burning and discomfort two years prior to admission. A 24-pound weight loss and daily vomiting prompted hospitalization. Physical examination was normal. Gastroduodenal examination revealed a lesion of the duodenal bulb. Exfoliative cytologic studies of the duodenum revealed malignant cells (Fig. 2). An adenocarcinoma of the first portion of the duodenum was resected along with a small portion of the head of the pancreas (Figs. 3 and 4). A pancreaticojejunostomy, cholecystojejunostomy, and gastroenterostomy were performed. The patient has regained her weight and is asymptomatic two years after surgery.

## Gall Bladder and Bile Duct Cancer

### STATISTICS

The clinical characteristics of gall bladder and biliary ductal carcinoma so closely resemble those of the head of the pancreas that only the salient features or interesting differences need be cited. Cancer of the gall bladder is reported in only 0.33 per cent of all autopsies, but represents about 3 per cent of all forms of cancer. Malignancy of the extrahepatic ducts is slightly more frequent and would be even greater if surgeons could differentiate more accurately between neoplasms arising in the head of the pancreas and those arising in the duct just proximal to its disappearance into the pancreatic substance. Seventy-five per cent of gall bladder cancers occur in females; there seems to be no sex difference for ductal neoplasms.

### CLINICAL FEATURES

Pain, dull, chronic and recurrent, is noted in many patients with gall bladder carcinoma and is located in the upper right quadrant. Only 40 per cent of common duct tumors cause pain. Obstructive jaundice occurs earlier and more frequently in malignancy of the duct (92 per cent) than in that of the gall bladder (60 per cent). Vague dyspepsia, anorexia, nausea and vomiting are typical gastrointestinal complaints. Severe weight loss and rapidly developing cachexia soon follow.

## Legends

Fig. 1. Microscopic section of pancreatic tumor. This adenocarcinoma originated from ductal epithelium. Note the abortive attempt at forming duct-like spaces and the formation of mucus by some of the cells. The stroma is dense, giving a scirrhous quality to the tumor.

Fig. 2. A small clump of basophilic cancer cells obtained by duodenal drainage and lavage from a case of primary cancer of the duodenum. This was the only clump of malignant cells obtained; all of the other cells were single. This finding was in keeping with the general pattern.

Fig. 3. Frozen section biopsy of carcinoma of the duodenum. The cancer cells are sparse and scattered throughout the stroma, a so-called "single-cell carcinoma." A mucicarmine stain identified the cells as adenocarcinoma and eliminated the possibility of a reticulum cell sarcoma.

Fig. 4. Gross specimen of primary adenocarcinoma of the first portion of the duodenum. Note how the infiltrating lesion has narrowed the duodenum. A part of the resected head of the pancreas is visible below the tumor.

Fig. 5. Microscopic section of left supraclavicular lymph node. These enormous metastatic cancer cells were suggestive of genitourinary malignancy. The tumor, however, originated in the gall bladder.

Fig. 6. Giant malignant cells obtained from duodenal drainage. These cells were carried into the duodenum from the gall bladder by bile flow. The similarity to the metastatic cells of Fig. 5 speaks for itself.

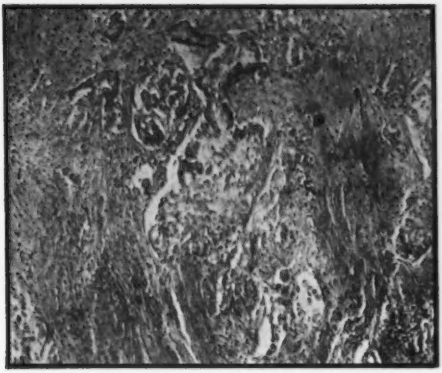


Fig. 1

Fig. 2

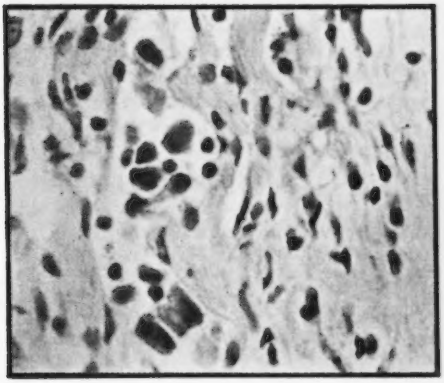


Fig. 3

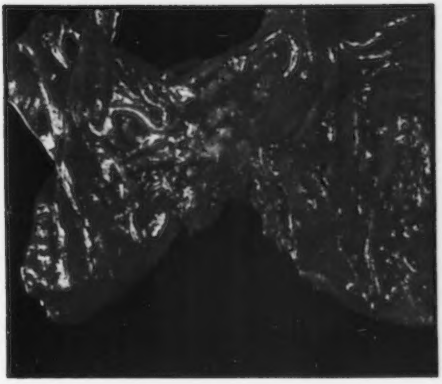


Fig. 4

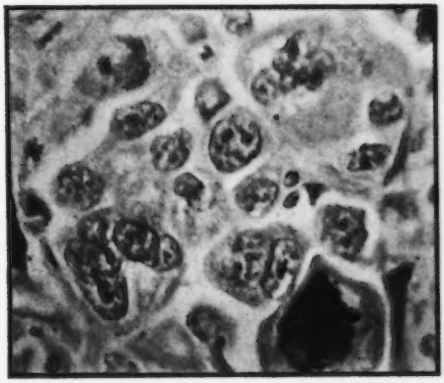


Fig. 5

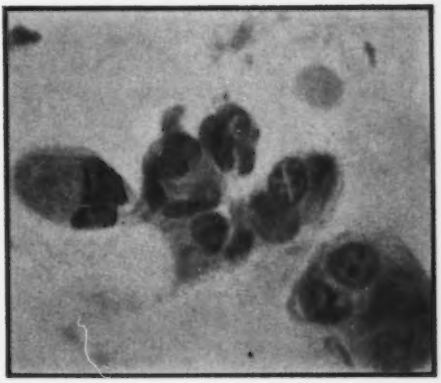


Fig. 6

Case reports 3 and 4 are examples of rapidly progressing tumors of the gall bladder and of the common bile duct, respectively.

CASE 3.—(F.C., #-576415) A 52-year-old taxi driver was admitted for treatment of a Staphylococcus albus pyuria. He complained of upper abdominal discomfort but no masses or areas of tenderness were noted; upper gastrointestinal and colon roentgenograms were normal. Within a few weeks a Virchow node (Fig. 5) and a right upper quadrant mass appeared. Duodenal drainage revealed highly anaplastic cells (Fig. 6); pancreatic secretory volumes and bicarbonate determination were normal, practically excluding the pancreas as the primary site. The patient died four months later. Autopsy revealed an infiltrating carcinoma of the gall bladder with retroperitoneal, hepatic and pulmonary metastases.

CASE 4.—(A.L., #-633607) A 66-year-old machinist was admitted after one week of generalized pruritus and jaundice and 30-pound weight loss of six weeks' duration. The liver was palpable; there was elevation of the serum bilirubin and alkaline phosphatase. Exfoliative cytologic studies of the duodenal aspirate revealed a moderate number of malignant cells (Fig. 7). A 2 cm long tumor of the common duct was found at surgery (Fig. 8). Reconstructive surgery was not feasible as the porta hepatis was involved; the patient withdrew a "T" tube drain and eventually died of bile peritonitis.

## Clinical Course of Malignant Tumors of the Liver

### STATISTICS

Primary malignant neoplasms of the liver defy early diagnosis. Their early recognition is of great concern as radical surgical procedures are available and may be highly successful. One and one-half per cent of all cancers originate within the liver. The presence of hepatoma often is overshadowed by a concomitant portal cirrhosis; tumor is an unexpected finding at autopsy in more than 60 per cent of cases.[23] Hepatomas are much more common in males than females, the ratio being reported as high as 12 to 1. In the United States, Negroes have the same susceptibility as whites, but carcinoma of the liver is one of the most common fatal neoplasms in some areas of Africa. Many theories have been proposed for this variance, including the restricted diet of the African and his use of copper pots. For many years portal cirrhosis, secondary to either alcoholism, malnutrition, hepatotoxin or syphilis, was considered as an almost absolute prerequisite to the development of hepatoma. However, it is now recognized that at least 50 per cent of these tumors are found in otherwise normal livers.

### SIGNS AND SYMPTOMS

The early signs and symptoms of liver cancer are insidious and slow to localize. Weakness and vague upper abdominal pain or discomfort are the most frequently mentioned complaints. A progressive anemia, cachexia, jaundice or respiratory distress may be the presenting manifestation. As the disease progresses, ascites may occur, which may be hemorrhagic secondary to necrosis of the tumor. Any change in the condition of a patient with portal cirrhosis of long duration characterized by a sudden acceleration of hepatic failure should arouse suspicion of a new growth.[4]

Pressure, thrombosis or invasion of any of several major veins adjacent to the liver usually produces catastrophic sequelae. Portal vein thrombosis causes splenomegaly, ascites and eventual hemorrhage from gastric and esophageal varices. Obstruction of the hepatic veins (Budd-Chiari syndrome) is characterized by the sudden onset of abdominal pain, nausea and vomiting. The liver and spleen rapidly increase in size; ascites, hepatic coma and death follow within a month. Massive edema of the legs is usually the first evidence of inferior vena cava obstruction; the marked albuminuria probably is sec-

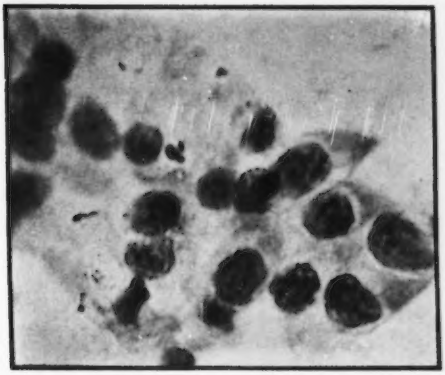


Fig. 7

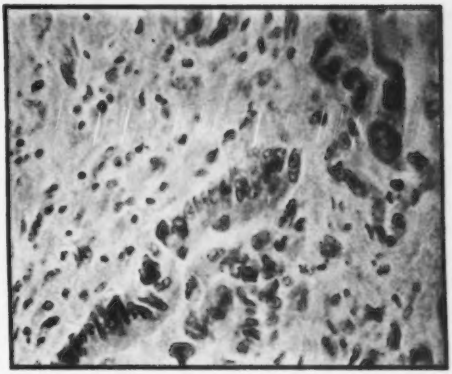


Fig. 8

Fig. 7. Cancer cells obtained by duodenal drainage from a case of obstructive jaundice secondary to malignancy of the common bile duct. With stimulation (secretin and pancreozymin), sufficient bile flowed past the narrowed area and carried these cells into the duodenum. Outstanding features are the increase in size of the nuclei which have rough, heavy margins and prominent nucleoli. The heavy chromatin clumping helps to establish these cells as malignant.

Fig. 8. Adenocarcinoma of common bile duct. Note bizarre cells with hyperchromatic nuclei. These cells compare favorably with those obtained by duodenal drainage (Fig. 7).

Fig. 9. Serial cross section of hepatoma of the right lobe of the liver. Note the metastatic nodules in the left lobe. The nodularity and scarring are typical of portal cirrhosis.

Fig. 10. Photomicrograph of hepatoma from Case 5. The highly cellular tumor has a papillary and trabecular pattern with relatively little connective tissue stroma. There is marked morphologic variation of individual cells.

Fig. 9

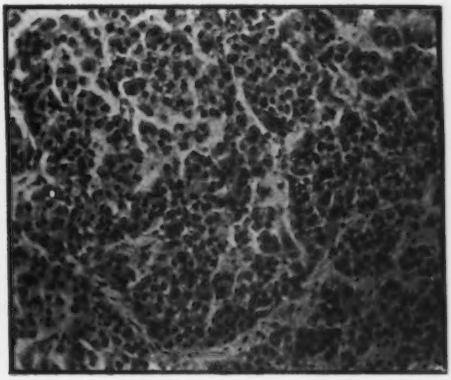


Fig. 10

ondary to the increased pressure within the renal veins.

The following case history describes the occurrence of a hepatoma in an alcoholic patient with portal cirrhosis.

CASE 5.—(G.B., #-130224) A 68-year-old male storekeeper had noticed anorexia, fatigability and malaise two months before admission. The patient admitted drinking two ounces of whiskey daily for most of his adult life. Physical examination revealed icterus, ascites and a hard, nodular liver. Abnormal hepatic function tests consisted of elevation of serum bilirubin, serum globulin and alkaline phosphatase and positive cephalin flocculation; serum albumin was depressed. A liver biopsy revealed portal cirrhosis. The condition of the patient deteriorated rapidly with increase in the ascites and the jaundice, the appearance of rectal bleeding, "flapping" tremors, and finally massive hematemesis with death on the forty-fifth day. Autopsy revealed ruptured esophageal varices secondary to primary carcinoma of the liver and portal cirrhosis (Figs. 9 and 10). The portal vein was thrombosed by tumor.

### Physical Examination: Neoplasms of Pancreas, Biliary Ducts and Liver

PANCREAS

One half of all patients with pancreatic carcinoma will have an enlarged liver when first seen. The extent of biliary obstruction and the size of intrahepatic metastases govern the degree of hepatomegaly. Distention of the gall bladder is often mistaken for an enlarged liver. Palpable abdominal masses do not represent an early stage of the disease unless perhaps the tumor has developed within a pancreatic cyst. Nevertheless, no more than 40 per cent of tumors are palpable, as the tumors average 5 to 6 centimeters in diameter. Ascites, serous, purulent, or hemorrhagic, is reported as an early finding in only 15 per cent of patients. The phenomenon of peripheral migratory phlebitis may herald the disease months before other symptoms. Other abdominal cancers, particularly gastric neoplasms, may be associated with peripheral phlebitis; the incidence in malignancy of the pancreas is about 9 per cent.[57]

GALL BLADDER AND BILE DUCTS

Palpatory evidence of tumor of these organs follows the pattern of pancreatic malignancies. Hepatomegaly and distended palpable gall bladders are not as frequent, however.

LIVER

The most important physical finding is that of an enlarged, nodular, tender liver. Often the liver enlarges quite rapidly. An elevated right diaphragm and bloody ascites are additional suggestive findings.

### Radiologic Diagnosis of Neoplasms of the Liver, Gall Bladder, Bile Ducts and Pancreas

No body system offers to the radiologist more difficulty in diagnosis and more temptation to overdiagnosis than the hepatic-biliary-pancreatic axis. However, the almost exponential increase in publication on this phase of roentgen diagnosis argues well for its eventual conquest.

An ideal method for the roentgen study of the liver has not yet been devised.[49] Evidence of hepatic deformity and diaphragmatic involvement may be obtained from routine examination without contrast media (Figs. 11A, 11B). Fluoroscopic examination may reveal fixation of the right leaf of the diaphragm. Even the appearance of a mass involving the diaphragm is not infallible.[48] Pneumoperitoneum may be necessary to differentiate intrahepatic masses from polyarcuate diaphragm (anteromedial bulge, partial eventration), diaphragmatic tumors, or diaphragmatic hernias (Figs. 12A, 12B).

Contrast materials for hepatic visualization have been investigated for

Fig. 11A

Fig. 11B

Fig. 11A. Chest film of man, 57, obtained on November 16, 1953. No lesion present.

Fig. 11B. Film of the chest in the same patient obtained on October 4, 1954, demonstrates the rapid development of a mass displacing the right hemidiaphragm upward. Surgical pathology: Hepatoma. Without the base line film, roentgen diagnosis would have been more difficult.

Fig. 12A. Man, 62, with mass in right diaphragmatic area thought to be hepatoma or diaphragmatic tumor. Note area of atelectasis.

Fig. 12B. Pneumoperitoneum demonstrates that the findings were due to polyarcuate diaphragm. Fluoroscopic demonstration of paradoxical motion in such a segment may also be diagnostic.

Fig. 12A

Fig. 12B

many years without success.[63] Thorotrast, which produces excellent and diagnostic hepatolienography, unfortunately, is radioactive and is retained permanently in the reticuloendothelial system. Since the advent of experimental and clinical evidence of carcinogenesis following the use of this colloid, the method is little used and, when employed, is limited to patients with short life expectancy. The use of halogenated materials has been successful in producing contrast visualization, but the serious hazard attendant upon their intravenous injection has precluded their use. Oral hepatosplenography[20] with halogenated oil and the use of zirconium compounds[55] have met with little success.

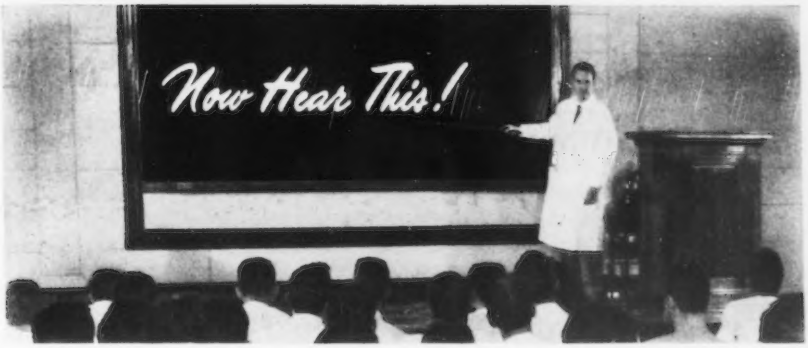
Opacification of the vascular system and of the biliary duct system are, at the present time, the only successful approaches to radiologic investigation of fine intrahepatic structures. Operative[40] or percutaneous[58] portal venography, splenoportography[1] and abdominal aortography[38,50,51] are successful and relatively safe methods of visualizing the vascular bed. Operative[26] and postoperative cholangiography,[25] intravenous cholangiography[29] and percutaneous transhepatic cholangiography[9,32,43] may be used for visualization of the intrahepatic biliary radicles. These cholangiographic methods are, of course, of even greater importance and diagnostic accuracy in investigation of neoplasms of the bile ducts themselves.

The use of radioactive iodine compounds (iodinated human serum albumin) and scintillation counting recently has been described as a method of great accuracy (96 per cent) in the diagnosis of carcinoma metastatic to the liver.[61,62] Liver metastases, two centimeters or more in diameter, apparently can be detected by this method. Either tumor tissue has a selective affinity for albumin or the increased cellularity and vascularity accounts for increased concentration within the cancer. Three hundred microcuries of $I^{131}$ albumin are given intravenously 24 hours before a scintillation counter is placed over the hepatic region. Tumor tissue will concentrate the radioactive albumin 30 per cent more than the adjacent tissues. A different approach to this problem is scinti-scanning following the administration of $I^{131}$ rose bengal and $I^{131}$ tagged Telepaque. These compounds are metabolized by the normally functioning liver cells; neoplastic areas are revealed by their failure to excrete the radioactive compounds. These tests are of practical value in the preoperative evaluation of patients with metastatic hepatic disease.

The diagnosis of carcinoma of the gall bladder by roentgenography alone is very rare. Usually cholecystography is a useless, nondiagnostic measure for, in the presence of carcinoma, the gall bladder rarely concentrates the opaque material. Even if visualization occurs in cases of combination of stones with tumor, a frequent association, differentiation of stone and tumor may be extremely difficult, if not impossible.

Several radiologic methods may be used in the investigation of the pancreas. By far the most commonly employed is gastroduodenal examination with barium sulfate suspension. However, there is much confusion concerning the roentgen abnormalities produced and their diagnostic reliability.

In recent years, splenoportography, operative pancreatography,[13] pneumoretroperitoneal pancreatography with laminography[53,66] and, experimentally, pancreatic angiography[64] have begun making their contribution to the diagnosis of pancreatico-ampullary lesions. *(Part II, and references in next issue.)*




*"It is tragic that many patients with rectal cancer are still being first treated for hemorrhoids, some even by hemorrhoidectomy, before the malignancy is found."*

**WHO:** **Dr. George E. Moore,** Director and Chief of Surgery, Roswell Park Memorial Institute.

**WHERE:** Buffalo, N. Y. March 20, 1961. Roswell Park Memorial Institute.

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*"It is now established beyond reasonable doubt that lung cancer would be reduced to less than 10 per cent of its present incidence if cigarette smoking were discontinued."*

**WHO:** **Dr. Brian MacMahon,** Professor of Epidemiology, Harvard University School of Public Health, Boston, Massachusetts.

**WHERE:** St. Petersburg, Florida. March 18, 1961. American Cancer Society's 1961 Science Writers Seminar.

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*"I believe the general practitioner has a very important part to play in management of the patient with cancer. The combination of his special abilities and knowledge of the patient, along with the specialized talents of the physician skilled in chemotherapy, frequently offers the patient more than either physician alone. Chemotherapy is a double-edged sword. It has definite beneficial effects in certain situations, but it does have definite profound effects on the patient's abilities to cope with the disease. Therefore, it should be used with great care."*

**WHO:** **Dr. Luther W. Brady, Jr.,** Associate Professor of Radiology, and Chief of Radiation Therapy, Hahnemann Medical College and Hospital, Philadelphia, Pennsylvania.

**WHERE:** Dayton, Ohio. April, 1961. Symposium on Cancer Chemotherapy.

*"The medical profession plays a pivotal role in cancer control far beyond its direct functions in diagnosis and treatment. When doctors lose hope, their patients know it. If doctors communicate the feeling that cancer is dreadful and irremediable, how can patients fail to despair? And frightened and despairing, how can they deal with the possibility that they have cancer? Their only recourse is to keep the possibility hidden—from themselves as well as their doctors. Thus, they court the very fate which they most fear. No physician, no matter how skillful, can treat the patient who stays away. Unwittingly, our own feelings reinforce the anxieties which keep them away, the very opposite of our intent. Perhaps the doctor, more than the patient, should be a target for emotional re-education."*

**WHO:** **Dr. Donald Oken,** Assistant Director, Institute for Psychosomatic and Psychiatric Research and Training, Michael Reese Hospital and Medical Center.

**WHERE:** "What to Tell Cancer Patients; A Study of Medical Attitudes." *J.A.M.A.* 175(13):1120-1128, April 1, 1961; p. 1128.

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*"At the medical school, where I teach, not more than 10% of our medical students now smoke cigarettes. Certainly, those who don't will set a good example for their patients."*

**WHO:** **Dr. Ernest L. Wynder,** Associate Professor of Preventive Medicine, Sloan-Kettering Division of Cornell University Medical College, New York, N. Y.

**WHERE:** New Jersey. February 14, 1961. Bergen County Medical Society Meeting.

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*"Even though a cure for cancer is found, early diagnosis will still be very important."*

**WHO:** **Dr. George N. Papanicolaou,** Papanicolaou Cytology Laboratory, Cornell University Medical College.

**WHERE:** New York City. April 19, 1961. Metropolitan Club.

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*"There are two or three modalities for the control of cancer of the breast. The first is the surgical castration or radiation castration. This will produce regression in the premenopausal woman. In Chicago it helps only 20%. However, in New York, where the ovaries are much more active, it apparently produces regression in 40%."*

**WHO:** **Dr. Samuel G. Taylor, III,** Assistant Professor of Medicine, University of Illinois.

**WHERE:** Chicago, Illinois. April 8, 1960. Seventy-Second Annual Meeting of the American Association of Railway Surgeons.

# Unproven Methods of Cancer Treatment

*The following statement on Carcin and Neo-Carcin, preparations proposed by Jacob Pawlotzky, M.D., was recently distributed to the 60 Divisions of the American Cancer Society for their information.*

The first known mention of Carcin is in a publication by Dr. Pawlotzky dated 1902. Neo-Carcin was proposed as an improved form of Carcin in 1953. The first articles appeared in Russia, then later in Switzerland, and still later in France. There is no available information concerning the preparation or manufacture of Carcin. In a prospectus put out by Pharma-Biologica S.A., Lugano, Switzerland, dated 1950, information was given that Neo-Carcin would be produced by this organization. In the prospectus the nature of the product was described as follows:

> The preparation is a mixture of active anti-cancerous substances. It contains some glandular extracts, some organic and inorganic substances, some extracts from plants, some corrective substances, some polypeptides in the same way as mesothorium and thorium X in oligodynamic dosage.
>
> "Neo-Carcin" is used as an active and specific adjuvant for the treatment of malignant tumors (carcinoma, sarcoma, lymphogranuloma) in all stages of the disease and equally for the humoral deterioration of the "cancerous dyscrasie." The treatment, according to the case, will last from 32 to 62 days.

In 1957 Carcin was reported to be available in five strengths, A, B, C, D and E in boxes of 50 tablets.

In a letter dated July, 1958, Dr. Pawlotzky stated that during his lifetime he had "cured over 100,000 cases of cancer, 40,000 of them in Germany alone." He added that he manufactured Carcin himself as a doctor and a chemist. "No one knows of my experiences and no one will be able to imitate it." He stated that before the war he had to give up his laboratory in France and since then had manufactured little Carcin. Pawlotzky further stated:

> Only one laboratory is necessary for the manufacture. However, considerable capital is needed to purchase the raw material, since very expensive materials are needed. In order to distribute this, a large quantity of Carcin must be prepared at one time. Within two months, unassisted, I can produce 2,000 treatments in tablet form.

He claims that Carcin is efficacious in 70% of serious cases treated, and that it is a preventive, and recommends its administration to healthy persons whose ancestors may have died of cancer. In the same letter, Dr. Pawlotzky noted that the patent rights to his remedy have been recovered from the firm which first undertook to sell Carcin and have been turned over to "a financially sound firm so that it would not be lost to mankind."

A letter and two-page presentation sent to some pharmaceutical companies in this country from J. Widmer, a merchant in Switzerland, in July, 1957, stated that Dr. Pawlotzky had kept the secret to himself, but not wishing to see it die, the doctor, at that time 75, would sell licenses to distribute Carcin throughout the world. According to this information Dr. Pawlotzky would travel to any country if the interested firm would put at his disposal a laboratory for a two month period. Widmer's letter said:

> During this time he could make two thousand curative packages assisted

by one of your chemists who afterwards will supervise the manufacture without particular difficulties.

Both in this material and in fliers distributed by Dr. Pawlotzky, profits "the same as Penicillin" are promised to those willing to undertake the project. A 1960 letter stated that Carcin "is obtained as a serum from especially bred, selected white mice."

Little is known about Dr. Jacob Pawlotzky. Mr. Widmer stated that Dr. Pawlotzky "is not only a medical man, but also holds a diploma as a chemist. He studied in Germany and holds a Doctor's Degree of the University of Bern." According to Mr. Widmer, Dr. Pawlotzky has treated thousands of cancer cases without compensation and has "sacrificed his entire fortune to this date in his fight against Cancer." His last known address (in 1957) was Bienne-Madretsch, Switzerland.

One of the best known European exponents of Carcin is Dr. Josef Issels, Chief of the Ringberg Clinic for Chronic Diseases and Tumors, Rottach-Egern, who has lectured to many groups and published many articles on his experience with Carcin.

Many individual reports on the use of Carcin have appeared in the literature. In 1946, Dr. Pawlotzky applied for a visa to allow him to market Carcin in France. The Director of the Pharmaceutical Division of the French Ministry of Public Health stated that after an extensive examination and test by the French Ministry of Public Health the application to market Carcin was denied on grounds that it was ineffectual in the treatment of cancer cases.

After careful study of the literature and other information available to it, the American Cancer Society has found no evidence that treatment with Carcin or Neo-Carcin results in any objective benefit in the treatment of cancer in human beings.

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The American College of Surgeons announces that a postgraduate course in Cancer Chemotherapy will be given at the 1961 Clinical Congress in Chicago on Oct. 2-6, 1961. Registration fee for the course will be $10.00.

Classes will be held from 8:30-11:30 A. M. on Oct. 3-6. Lectures on specialized subjects will be presented under the general headings of Basic Concepts in Chemotherapy; Systemic Chemotherapy—Oral and Intravenous; Special Techniques; Present Status of Cooperative Adjuvant Chemotherapeutic Studies.

Further information may be obtained by writing the American College of Surgeons, 40 East Erie Street, Chicago 11, Illinois.

Aerial view of Charity Hospital, New Orleans, La. Inset: Edward T. Krementz, M.D.

# Present Status of Chemotherapy of Cancer by Regional Perfusion

*The editor interviews Edward T. Krementz, M.D., Department of Surgery, and Cancer Teaching Coordinator, Tulane University School of Medicine, New Orleans, Louisiana.*

DR. GRANT: *Dr. Krementz, chemotherapy of cancer by regional perfusion with the heart-lung machine began at your institution. What has your experience been so far?*

DR. KREMENTZ: Our experimental work with this technique began early in 1957 and our first patient was treated in June of that year. Since that time, we have perfused 317 patients with malignant disease on 373 occasions.

DR. GRANT: *A large number have been melanomas, right?*

DR. KREMENTZ: Yes, 134 patients had carcinoma, 107 malignant melanoma, 53 various sarcomas and 23 glioblastoma multiforme of the brain.

DR. GRANT: *You have been perfusing all parts of the body?*

DR. KREMENTZ: Yes. Isolation of the extremities and lungs for perfusion has been most satisfactory, while in areas such as the pelvis and oropharynx the isolation is very poor.

DR. GRANT: *Dr. Krementz, what are the special advantages of perfusion techniques for cancer?*

DR. KREMENTZ: Better therapeutic effect with less toxicity is obtained by intra-arterial administration of the drug. Isolation of the drug from the rest of the body permits high dosage. Six to eight times the maximum systemic dose may be administered locally. A 300 to 400 per cent increase in oxygen tension is obtained in the isolated area which seems to potentiate the action of alkylating agents. By keeping the drug localized, toxicity and secondary impairment of the host-defense mechanisms are decreased. Finally, upon completion of perfusion, residual active drugs and toxic end products in large extent can be removed.

RESULTS OF CHEMOTHERAPY OF CANCER BY PERFUSION: ADJUVANT PERFUSION*

| RESULTS | CARCINOMA | SARCOMA | MELANOMA | TOTAL |
|---|---|---|---|---|
| *Living:* | | | | |
| Controlled | 5 | 7 | 14 | 26 |
| Recurrent | | | | |
| Temporary Response | 1 | 0 | 3 | 4 |
| No Response | 0 | 0 | 0 | 0 |
| *Dead:* | | | | |
| Temporary Response | 1 | 1 | 2 | 4 |
| No Response | 0 | 0 | 0 | 0 |
| Operative | 1 | 0 | 0 | 1 |
| Total | 8 | 8 | 19 | 35 |

**Results through January 31, 1961.*

DR. GRANT: *What are the indications for chemotherapy by perfusion?*

DR. KREMENTZ: It has been used first as an adjunct to standard excisional or radiation therapy; secondly, for the treatment of regionally confined, but nonresectable tumors. Also, it is used to convert inoperable tumors to an operable condition, and for the palliation of advanced cancer.

DR. GRANT: *I suppose many chemotherapeutic agents are being tested by this technique.*

DR. KREMENTZ: Yes, our experience, however, has been limited to the use of 10 different chemotherapeutic agents, alone and in various combinations. They are HN2, CB 3025, TSPA, TEM, AB 100, Actinomycin D, 5-FU, Dihydro E 73, Mitomycin C, and VLB.

DR. GRANT: *What has been the most satisfactory use of this technique?*

DR. KREMENTZ: From our experience, the most effective treatment has been for advanced malignant melanoma with phenylalanine mustard alone or in combination with TSPA. We have also obtained good results with soft tissue sarcomas and a few advanced carcinomas of the pelvis which remain locally confined for long periods and in which we have been successful in getting a moderate degree of isolation. The charts above summarize our experience to date.

DR. GRANT: *Various modifications of this technique are being worked out. Are they promising?*

DR. KREMENTZ: One of the more dramatic developments has been the use of hyperthermia to the perfused area to intensify the effect of the drugs and hypothermia to the remainder of the body to reduce toxic effects of the drugs. Also, elaborate tourniquets and obstructive catheters are being used to isolate the perfusion area.

RESULTS OF CHEMOTHERAPY OF CANCER BY PERFUSION:
REGIONAL PERFUSION FOR PALLIATION*

| RESULTS | CARCINOMA | SARCOMA | MELANOMA | NEURAL | TOTAL |
|---|---|---|---|---|---|
| *Living:* | | | | | |
| Quiescent** | 15 | 6 | 29 | 1 | 51 |
| Recurrent | | | | | |
| Temporary Response | 11 | 5 | 29 | 3 | 48 |
| No Response | 5 | 3 | 1 | 0 | 9 |
| *Dead:* | | | | | |
| Temporary Response | 22 | 10 | 15 | 12 | 59 |
| No Response | 21 | 6 | 3 | 0 | 30 |
| Operative | 11 | 2 | 0 | 7 | 20 |
| Chemotherapy | 0 | 0 | 5 | 0 | 5 |
| Total | 85 | 32 | 82 | 23 | 222 |

**Results through January 31, 1961.*
***Quiescent—No evidence of tumor or tumor present without evidence of activity.*

DR. GRANT: *Isn't simplification also taking place by the use of intermittent perfusion without the heart-lung machine?*

DR. KREMENTZ: Yes. Fractional intraarterial chemotherapy combined with X-ray therapy as described by Sullivan, using Methotrexate intraarterially and citrovorum factor as an antidote intramuscularly has considerable promise, in my opinion.

DR. GRANT: *Dr. Krementz, what do you think has been the principal gain made by regional perfusion of chemotherapeutic agents for cancer?*

DR. KREMENTZ: I believe that one of the important gains has been that it has demonstrated the value of combining various therapeutic techniques. When radiation, surgery and chemotherapy are used alone, each has certain potentialities, but when combined, additional therapeutic advantages are gained. Also, this experience discredits the oft-repeated statement that surgery has gone as far as it can in cancer. Perfusion initially was greeted with great skepticism and, indeed, some opposition. Yet, in a matter of only four years, it has been accepted in many treatment centers as a necessary part of the armamentarium for total cancer care. Certainly, as a research tool for testing the efficiency of various drugs, it is of undisputed value.

DR. GRANT: *Thank you.*

# CANCER AROUND THE WORLD

## Teen-age Anti-Smoking Campaign in Denmark

Anti-cigarette-smoking propaganda in many countries has focused on the rising incidence of lung cancer. The message has been addressed mainly to adults. Their response, to put it mildly, has not been encouraging.

The Danish Cancer Society decided to start where smoking starts—and can better be stopped—*among schoolchildren*. To establish a statistical, moral background for such a program, a poll first was conducted in Danish elementary schools. Denmark's Pedagogical Institute picked out schools in Copenhagen, suburbs, towns and rural villages, to yield a fair, nation-wide sampling of 11- to 14-year-olds' habits and opinions.

This project was not launched arbitrarily or unilaterally. The resolution to conduct the poll and follow through with the campaign was passed at a meeting in late 1957, held, at the Cancer Society's request, at the Danish Board of Health. On hand were delegates from the Ministry of Education, Board of Health, Danish Medical Society, Statistical Department, Danish Teachers Organizations, Copenhagen Board of Education, and, of course, the Danish Cancer Society.

The poll was taken in 1958 by Finn Lambert, a school psychologist, who interviewed a total of 3,109 children (1,632 boys, 1,477 girls) in class groups.

The survey started children thinking, but not *acting*—because they were not actively involved. So, in March, 1960, the Society announced a nationwide poster contest open to every schoolchild (a separate entry category later was opened for adults) and offering cash prizes.

Announcements were mailed to about 4,400 schools. Since we know that many schools screened the entries, we can safely say that *more than 10,000 Danish schoolchildren were racking their brains to picture the hazards of tobacco.* Some pictures were enough to scare the nicotine out of a confirmed chain smoker.

About 6,400 placards were submitted by the schoolchildren. Another 117 entries came in later from adults, including professional artists. In December, 1960, some time after the judging, an exhibit was arranged in Copenhagen's Town Hall. The top 10 juvenile prize-winners met the press when the show opened, and hundreds of adults saw the 500-placard display in the days that followed.

Every school received a set of four full-color poster reproductions (Figs. 1, 2, 3, and 5). Fig. 3 is the work of a professional artist who won first prize in the open competition. The other three are by children. Small gummed stickers will be made from one of the posters Fig. 2 which can be used on letters, but which are mainly intended to be glued on matchboxes.

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*From the Danish Cancer Society, Reventlowsgade 16, Copenhagen 5, Denmark.*

When the booklet-phase of the campaign was launched, the Danish Cancer Society had yet another prize-wining professional poster (Fig. 4) reproduced full-size and in quantity. This was posted on bulletin boards in every railroad station in Denmark. A huge, baited, hungry-looking mouse trap bears the label "Lung Cancer." Two words across the bottom read: "No Thanks."

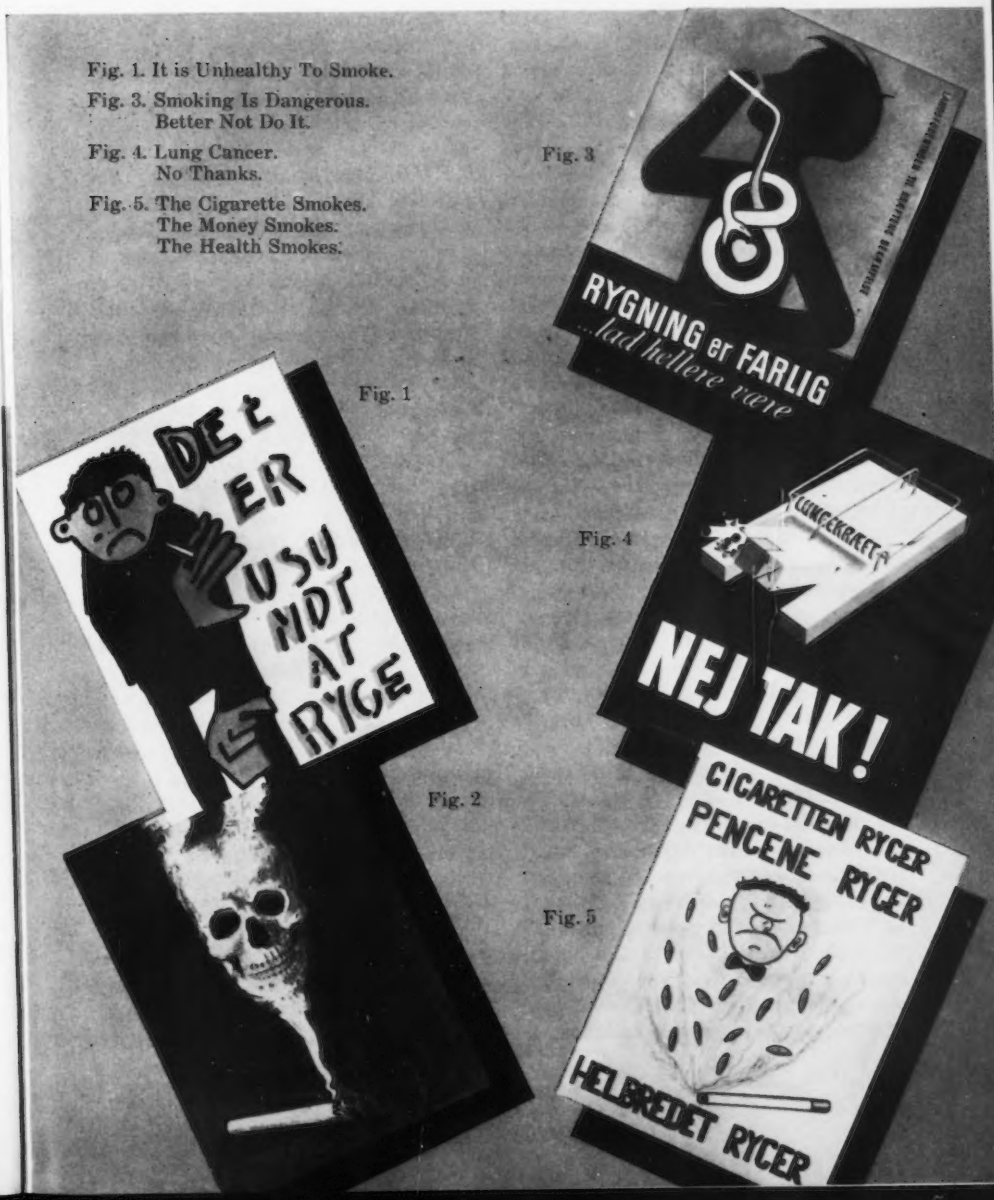


Fig. 1. It is Unhealthy To Smoke.

Fig. 3. Smoking Is Dangerous.
Better Not Do It.

Fig. 4. Lung Cancer.
No Thanks.

Fig. 5. The Cigarette Smokes.
The Money Smokes.
The Health Smokes.

Fig. 3

Fig. 1

Fig. 4

Fig. 2

Fig. 5

# FEEDBACK

TO THE EDITOR:

On pages 109-110 of the current issue of *CA* (May-June 11:3) you present a well written but most surprising interview with a New Jersey-New York pathologist, Doctor Daniel Roth. The "Q & A" session elicits the astounding information that because clinical pathology is gradually overshadowing anatomic pathology, the medical specialty of pathology is doomed. In the future, we are told, a pathologist will be a "specialist with an advanced academic degree" not necessarily an M.D. He will be attached to a clinical department, the over-all chief of which will be a clinician trained in clinical and experimental research.

Doctor Roth apparently feels that "pathologist" is synonymous with "autopsy-and-surgical pathologist." The "traditionally" trained pathologist faces accelerated obsolescence; he and all his brother pathologists will disappear as an identifiable group. He concludes with a revealing, regretful, statement that the fullest expression of the physician pathologist is to be found in the necropsy room.

Both the American Society of Clinical Pathologists (more than 3,000 members) and the College of American Pathologists (also over 3,000) will be surprised to hear that the pathologists are faced with extinction. It is precisely the growth of clinical pathology of the last 25 years which has sparked the tremendous revitalization and mushrooming growth of our specialty. Pathology is not withering. On the contrary, it is growing rapidy both numerically and in prestige. In recent years the American Board of Pathology granted the third largest number of certificates of all 19 Boards, exceeded only by internal medicine (first) and surgery.

In 1922 the ASCP was founded in a determined effort to get the so-called pathologic anatomist out of the morgue and out of armchair pathology. We retain our interest in anatomic, academic and experimental pathology, but we are oriented also to the living, breathing patient. Our zealous Commission on Continuing Education is composed of nine scientific Councils covering all fields of anatomic and clinical pathology. Our Journal covers the entire spectrum of so-called laboratory medicine. The ASCP is only one of five national pathology societies, but the program of this one group alone, even in outline form, would fill several pages of *CA*. We cordially invite Daniel Roth, FASCP, to re-orient himself in the field of clinical pathology and in the clinical aspects of anatomic pathology. We feel confident that we can bolster his confidence and that of your readers in the unlimited future of the progressive and progressing medical specialty of pathology.

JOHN J. ANDUJAR, M.D.
Office of the President
American Society of
Clinical Pathologists

P.S. While I happen to be President of ASCP, Vice President of International Society of Clinical Pathology, and Trustee of the American Board of Pathology, this letter is of course my own!—J. J. A.

TO THE EDITOR:

I read "A Perspective in Pathology" published in *CA*, May-June, 1961. Frankly, I find the comparison of a progressive clinician and a stagnant or regressive pathologist distasteful. I would like to point out that at the end of the prescribed training in pathology the physician is a raw product ready for general practice in the field of pathology. This is not unlike the situation in clinical medicine where the young internist wherever there is reasonable physician density, competes with the general practitioner in practice. Progress in clinical medicine has necessitated subspecialization. The same is true in pathology.

In clinical pathology there is no question that the rate of growth has been overwhelming in the past few years. Perhaps those schools offering a combined course of electronics and medicine will bring a reasonable answer to the supervisory personnel for complicated instrumentation. Even in this immature state in our laboratories approximately 70 per cent of all of the biochemistry tests requested are essentially automated. A similar future exists for all of the clinical laboratory fields. The pathologists has equal ability and possibly greater opportunity to subspecialize in the interpretation and utilization of this type of information in any limited field of interest. It is totally unrealistic to feel that the current practicing pathologist shall be a subspecialist in all of the branches of clinical pathology and anatomical pathology. Growth in this field will be through subspecialization following a modified general training program. One can not anticipate facility in electronic computers without an orderly program from arithmetic tables through calculus.

As far as the morbid anatomist is concerned it is true that their rates of progress have not kept pace with either the clinical pathologist or other fields of medicine. He has in the past satisfied himself with diagnostic training based purely on repetitive experience. However, the opportunity still exists for the pathologist to rapidly expand diagnostic and investigative procedures in human tissues, both surgical and necropsy. A number of the fields which are within the immediate domain of the morbid anatomist include electron microscopy, tumor transplantation, histo-chemistry, fluorescent microscopy, cellular micro-chemistry and immunochemistry. These are only some of the expanding although directly responsible domains of the tissue pathologist.

I forsee that the future for pathology will be brilliant. This border field has all the hope of utilizing clinical material for basic investigations. I am sure that the yield from special studies will compare very favorably with those devoted entirely to experimental situations. Within the field of pathology, subspecialization of a progressively increasing complexity is to be anticipated. However, some of our traditional duties perhaps not in vogue today, still remain as vital teaching and service duties.

ARTHUR A. STEIN, M.D.
Professor of Pathology
The Albany Medical College of
Union University
Albany, New York.

TO THE EDITOR:

This editorial letter is written in response to your interview with Dr. Daniel Roth, entitled "A Perspective in Pathology," published in the May-June issue.

I have consulted the Presidents of the American Board of Pathology, Roger D. Baker, the American Society

of Clinical Pathologists, Dr. John J. Andugar, and the College of American Pathologists, Dr. Frank C. Coleman. Since I am affiliated with these three organizations, have practiced hospital pathology, trained residents, done research and taught medical students, I shall attempt to present modern pathology as I see it from these several viewpoints.

Pathology has been and continues to be one of the principal basic sciences of medicine. As in all medical specialties it rests firmly on a triad of teaching, research and care of the patient. In the latter sense, the pathologist practices medicine just as surely as does the clinician.

Anatomic pathology — cellular pathology—has been the basis for understanding disease and will continue to play a dominant role as long as the experiments provided by nature are skillfully and imaginatively interpreted by the pathologist.

Clinical pathology—extracellular pathology—is assuming, and rightfully so, a more and more prominent role in the science and practice of pathology as a response to the increasing knowledge in the diagnosis and treatment of disease. Cellular and extracellular pathology are and must continue to be correlated by the complete pathologist. Indeed, perceptive clinicians are increasingly demanding such correlation. Naturally, if the pathologist does not choose to keep up with advances in his legitimate field, he will surely lose his time-honored role as the "doctor's doctor."

A few facts will put the triad, as it applies to pathology, in perspective: The teaching of undergraduate pathology in medical school, predominantly by experienced hospital pathologists, who also have an interest in and flare for teaching and research. There is a trend toward correlating anatomic pathology with clinical pathology whether the latter be taught by the department of pathology or in correlation with clinical departments.

That gifted medical students are still attracted by the intellectual content of pathology, per se, is shown by the 10 senior medical students who won the American Society of Clinical Pathologists Sheard-Sandford Award and the eight who received a medal given jointly by the ASCP and Bausch and Lomb for meritorious research in pathology. Suffice it to say that these awards all were well-distributed throughout the country. All of the students come from departments of pathology whose chairmen see pathology in its modern perspective. Many of these award recipients will go into pathology as a career. Excellent students are similarly attracted to pathology by spending a year between their second and third year of medical school at a teaching hospital pathology laboratory.

During the past 10 years there has been a 50% increase in the number of approved resident training programs in combined anatomic and clinical pathology. The majority of university training programs are of this type, 86%; all 81 medical schools offer some approved residency training in pathology. Over 300 pathologists are certified annually by the American Board of Pathology, approximately 200 of them in clinical pathology. An increasing number of subspecialists in pathology, M.D.'s are being certified in the field of Clinical Chemistry, Hematology, Microbiology and Forensic Pathology.

The practice of pathology — necessarily the practice of medicine — is and must be directed by the pathologist. His function, as a practitioner of medicine, cannot be delegated to a nonmedically-trained scientist and should not

be delegated to the clinician. In so doing the field of pathology is fatally splintered. The uniqueness of the pathologist is that he understands disease as a whole. He can delegate his technical functions but he cannot and must not delegate his correlative functions. Pathologists of this stature are being educated and trained in increasing numbers to assume their proper role in the increasingly complex field of medicine as practiced in the modern community and university hospital.

Pathology as a specialty will lose its dominant role only by default of the pathologist.

ARTHUR T. HERTIG, M.D.
21 Everett Ave.
Winchester, Mass.

TO THE EDITOR:

I find your little magazine *CA* generally most useful and interesting and I believe it deserves a wide circulation.

However, I think that your interview with Dr. Daniel Roth on page 109 of the May-June 1961 issue leaves something to be desired. I think that Dr. Roth's crystal ball is very clouded. I find that in most institutions exactly the opposite of his prediction is occurring. Where there was formerly one pathologist there are now two or three to meet the great demands of the clinician for physicians experienced in the supervision of laboratory tests and their interpretation. The pathologist just as every other physician must view with equanimity the fact that his knowledge and indeed all medical knowledge becomes obsolete at an increasing rate; this should not be deplored but should be welcomed enthusiastically as an indication of our increasing approach to the truth.

The disinterest in autopsy findings which Dr. Roth prescribes is not completely true, if at all; many medical journals, for example the *New England Journal of Medicine*, have an enormous circulation based more on their excellent clinical pathological conferences than on any other aspect of their publication.

I do not believe that my feelings in this are unique. In an interesting discussion of just this subject at a pathologists' meeting the other night comments by Dr. Max Wachstein and Dr. Paul Klemperer indicated that the same fears expressed by Dr. Roth have been expressed for many years and do not seem to be borne out by present developments.

ROY N. BARNETT, M.D.
Director of Laboratories
The Norwalk Hospital
Norwalk, Connecticut.

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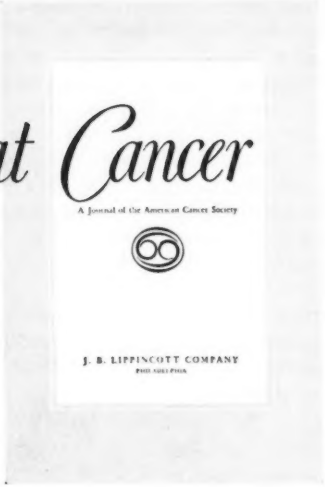
A major professional educational development in cancer this year is the publication of the Proceedings of the Fourth National Cancer Conference.

The papers and lectures presented at the Conference held in September, 1960, under the joint sponsorship of the American Cancer Society and the National Cancer Institute, compose this 774-page volume. Included is a wealth of illustrative material and a comprehensive review of "Changing Concepts Concerning Cancer." The publication should be of interest to research scientists, physicians in practice, interns, residents and medical students.

Copies of the Proceedings are available at a cost of $9.00 each and may be obtained by writing to J. B. Lippincott Company, East Washington Square, Philadelphia 5, Pa.

# Looking at Cancer




A commentary on the July-August, 1961 issue of CANCER, a journal of the American Cancer Society, Inc.

***John W. Berg, M.D.***
**Associate Editor, Cancer**

Two new approaches to cancer chemotherapy are described; both seem effective means of achieving better responses with present agents. Duff, Sullivan and their co-workers detail their methods of giving supralethal doses of methotrexate by continuous regional perfusion while protecting the patient with its specific antagonist, citrovorum factor. Almost as important as the technique is the fact that such a study was successfully carried out over half the world—from New York, where preliminary development had been done, to Nairobi, Kenya, where there was a large concentration of particularly suitable patients.

Razis and his colleagues at Roswell Park report on their improved results with a "dual antagonist"—nitrogen mustard combined with a urethan precursor in a single molecule. This drug, benzcarbimine, tested in lung cancer was of low toxicity. It was effective in at least 11 of 28 patients and perhaps most significantly tended to produce longer remissions than nitrogen mustard.

Goldenberg and Hayes report that 2 -methyl dihydrotesterone propionate was as effective as testosterone in the treatment of breast cancer and produced almost no masculinization.

As cytology leads to the detection of more and more in situ cervix cancer, the problem of conservative versus radical therapy becomes more and more important. Often a cone excision is recommended with further surgery only if cancer is found at the margin of the cone. Schulman and Cavanagh have examined this approach and cast doubt upon its logic. A hundred patients had conization, then hysterectomy regardless of the margin report. Margins were involved in 53 cases and of these residual cancer was found in 47%. The margins were supposedly clear in 47 cases but cancer was found in 21% of these and dysplasia in another 25%. Examination had been as thorough as is usually practicable and the authors favor multicentricity of the cancer as an explanation for these results rather than inadequate sectioning. Obviously, cone excision appears to be a doubly borderline

procedure: Margin involvement is seen in half the cases and even when it is not seen, there is a substantial chance of cancer being present in the residual tissue.

Reid and Carr take a long hard look at the chaotic state of lung cancer terminology. By demanding that pathologic grouping reflect clinical behavior they have reduced the innumerable possible groups, subgroups and combinations of groups to four basic categories. Of these, the squamous-transitional cancers have the best prognosis, adenocarcinomas and large cell pleomorphic cancers intermediate values, and small cell (oat cell) cancers, by far, the worst. Since these four groups have other specific clinical correlations, they seem to serve well as basic conceptual units.

The world information on thyroid cancer in children is brought up to date by Winship and Rosvoll. They tabulate 148 new published cases and 247 unpublished cases located by surveys. The disease appears to be on the increase. Despite the fact that major criticism can be leveled against the studies claiming radiation etiology for this disease [*e.g., see Sterling et al. in a forthcoming issue—J. W. B.*] a radiation history was found in almost 80% of the children for whom such history was sought.

Melamed et al., in analysing 107 cases, resolve the confusion about the prognostic significance of gelatinous foci in breast cancer. When the picture was entirely mucoid, the patients did remarkably well: 78% as opposed to 50% expected five-year survival, 45% as opposed to 29% crude 10-year survival. However, the greater the proportion of nongelatinous tumor, the closer the prognosis approached the control group. Hence, the total group with all degrees of gelatinous change was not as clearly favorable.

The adverse effects of radiation to the intestine are partly due to direct injury, but fatalities seem due to secondary bacteremia. Spratt and his co-workers pretreated dogs with sulfasuxidine. None of six died, though four of five untreated controls did succumb after 4000r was delivered to exteriorized bowel.

# cancer abstracts at a glance...

### Implantation in Intestinal Cancer

Evidence is given for implantation in cancer of the large intestine, both from the lumen and from the peritoneal surface of the tumor-containing bowel.

After the 1939-1945 war, modern advances led to a new interest in anterior resection in the treatment of carcinoma of the rectosigmoid and rectum. It soon became clear, however, that there was a marked local recurrence from this procedure. It is now thought that implantation at the suture line is the cause of many of the local recurrences, and efforts have been made at St. Mark's Hospital to eliminate such implantation by careful toilet with a 1:500 solution of mercury bichloride.

The apparent incidence of local recurrence after anterior resection is between about 10 and 16 per cent, but with the use of mercury bichloride for 12 years the incidence has fallen at St. Mark's Hospital to 2.6 per cent in 229 patients followed for more than two years. The use of mercury bichloride in other surgery for carcinoma of the colon and rectum is also described.

—AUTHORS' SUMMARY

*Keynes, W. M.: Implantation from the bowel lumen in cancer of the large intestine. Ann. Surg. 153:357-364, March, 1961; p. 363.*

### Carcinoma of the Cervix

An epidemiologic study was made of 122 hospital patients with histologically confirmed squamous cell carcinoma of the cervix and an identical number of controls with other gynecologic diagnoses matched by race and age.

No association was found between carcinoma of the cervix and the number of pregnancies, the duration and frequency of douching, or douching with coal tar derivatives. There was some indication of associations with syphilis and with non-circumcision of the marital partner, but these are uncertain because of the high proportion of patients for whom the data were not available. Significant associations were found between carcinoma of the cervix and early marriage, multiple marriages, extramarital relations, early coitus, frequent coitus, and non-use of contraceptives.

The results of this investigation are consistent with the hypothesis that coitus is a major factor in the genesis of carcinoma of the cervix.

—AUTHORS' SUMMARY

*Terris, M., and Oalmann, M. C.: Carcinoma of the cervix; an epidemiological study. J.A.M.A. 174: 1847-1851, Dec. 3, 1960; p. 1851.*

# verbosity at the flood

Physicians are literally swimming in printed facts and there is no rescue in sight. The pump-priming of research has resulted in a flood of investigators' reports which are swelling the channels of medical communications and threatening to inundate the medical profession with information. This abundance of data is seeking outlet through a multitude of newly formed scientific societies which, in turn, have given rise to numerous new medical periodicals.

Since many of the new discoveries have been at very basic scientific levels, they have stimulated multidisciplinary research and an almost geometric expansion of scientific investigation has taken place. Thus, the growth of medical communications has reason to be torrential in nature.

The formation of each new medical society and medical journal raises hopes that finally there are enough to meet the needs. However, new ones keep forming and, apparently, find useful places in the scientific world.

This outpouring has been responded to by the pharmaceutical industry. In recent years, the entire spectrum of periodicals which they support has shown tremendous growth and improvement to the point where these free-to-the-physician periodicals play an important educational role for a large segment of the profession. Information on cancer makes up a large part of the contents and improved care of cancer patients will surely result from this increased dissemination of information.

One of the new developments in medical communications has been the medical newspaper. Several years ago, when it was announced that a weekly medical newspaper was being launched, questions arose as to how enough information could be gathered at such short intervals and how the tremendous costs could be met and, indeed, whether there was even a need for such a publication. Those with misgivings, have now had the experience of observing the birth and growth of a vigorous and important addition to the medical communications family—the medical newspaper. Outstanding examples of this type of medical communication are the *AMA News*, *Medical Tribune*, *World Medical News* and *Medical News*. These publications have been replete with news about cancer. The physician is presented with authoritative reports of medical meetings within hours of the meeting itself. This rapid pace gives the publishers special responsibility in maintaining high standards of selectivity and accuracy of presentation. Anything less could result in loss of life or suffering due to misinformation or misunderstanding.

Excellent quality notwithstanding, is there not a saturation point—is there not a high water mark in this flood of verbosity? Apparently, there is not, for as the research wheels turn faster and faster, ideas and words pour forth at an ever increasing rate and must be published. It may be anticipated that a daily medical newspaper is not far in the offing and it may be followed by A. M. and P. M. editions.

As we are about to disappear under a heap of papers in this flood of verbiage we can go assured that we were well informed while it lasted.

Ronald M. Grant

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## THE PHYSICIAN AND THE CANCER PATIENT

**The American Cancer Society is concerned with the *total* cancer problem. A crucial part of this problem relates to the cancer patient and his family. To help the medical profession explore ways and means of meeting the patient's special needs, the scientific session of the Society's next Annual Meeting at the Hotel Biltmore in New York City, October 23-24, 1961, will be devoted to "The Physician and the Total Care of the Cancer Patient." Various specialists will examine the psychological and physical problems facing the cancer patient and his family. Consideration will be given to such topics as decisions in the early care of the cancer patient, counselling the cancer patient, what the patient should be told, care of the advanced cancer patient, society's role in service to the cancer patient.**

**Through such meetings, the American Cancer Society serves the medical profession by providing a forum for an exchange of information and experience concerning the cancer patient.**

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